Claims 1, 3-6, 8-15, 20, 24, and 25 were rejected under 35 U.S.C. §103(a) over Sohnius (U.S. 3,607,741) in view of Rowell (EPO 213,252). Claims 1, 3-6, 11, 15, 17, 20, 24, and 25 were rejected under 35 U.S.C. §103(a) over Norman et al. (U.S. 4,379,746) in view of Rowell. For more reasons more fully discussed below, it is believed that all of these rejections are overcome and their withdrawal is requested.

The undersigned attorney wishes to thank Examiner Cintis for the telephonic interview of August 1, 2002. The references Sohnius and Norman were discussed as well as evidence of the superior oil collecting ability of the applicants' claimed composition. The Examiner's interview summary fairly describes the topics discussed during that interview.

Claims 1, 3-6, 8-15, 20, 24, and 25 were rejected under 35 U.S.C. §103(a) over Sohnius in view of Rowell. Applicants respectfully suggest that Sohnius in combination with Rowell do not make the claimed invention obvious. Specifically, the present invention provides unexpected results and advantages that are not suggested or made obvious considering these references either singly or in combination. The claimed invention provides a method of absorbing hydrophobic, water-immiscible liquids with a lignocellulosic plant material, which has been modified by esterification of hydroxyl groups in the lignin of the material. Examples are discussed in the application. A lignocellulose fiber was acetylated according the procedure described in Example 1 and described in the Response to the Office Action dated May 4, 2001, which is incorporated herein in this response.

In addition, the applicants have now provided the undersigned attorney the following additional results.

Paper pulp was prepared as described in Sohnius for evaluation. The pulp was treated with silicon, (poly(dimethyl) silicone sold under the trade name dimethicone), paraffin (either liquid paraffin BP or microcrystalline paraffin wax emulsion sold under the trade name Mobilcer 538), calcium stearate, and 3,5-dimethyl-1-hexyn-3-ol. If the preparation described in Sohnius was followed, the resulting material was hard and quite dense as

expected for dried paper pulp. The material would float on water for a long time and would pick up oil, but only very slowly.

The oil adsorbing ability of paper pulp treated as described in the present application was compared to that of a paper pulp prepared according to Sohnius as described above. The two different materials were dropped on to a continuous slick of oil (thermal oil was mixed with water at about 500g/m^2). The material prepared according the method of Sohnius picked up close to 6.6 times its weight in oil as was suggested in this reference. However, this material adsorbed oil very slowly. In comparison, the pulp prepared according the present invention picked up 14 times it weight in oil from a similar oil slick even after floating on the water for 18 hours beforehand. These results indicate that pulp prepared according the present invention absorbed over twice the amount of oil that the pulp prepared according to the method of Sohnius absorbed.

In another experiment, bleached chemo-thermo-mechanical pulp (PCTMP), which is the stock for the production of paper, was acetylated as follows in accordance with the procedure of the claimed invention. The BCTMP was packed into an oil jacketed reactor heated with 130°C oil. The acetic anhydride was heated to 130°C and transferred by vacuum into the reactor. After 10 minutes the acetic anhydride was transferred back out of the reactor. After a further 10 minutes the reactor sump was sucked out again. After 2 hours in total, the sump was drained then a vacuum applied. After 1 hour, the heating was switched off and a sample was taken. Air was allowed to bleed into the reactor. After 16 hours the reactor was opened and a sample of the treated pulp was taken. The rest of the treated pulp or fiber was transferred to a 105°C oven.

The treated pulp or fibers were assessed on its ability to remove transformer oil from a mixture of oil and water according to the following procedure: Twenty grams of oil was poured into 400ml of water and stirred with a mechanical stirrer so that it breaks into droplets. One gram of the treated fiber was added to the oil and water mixture, which was continuously stirred for 1 minute after the addition was completed. After a further 30 seconds the mixture was visually assessed to determine how much unattached oil (or free floating oil) in the water was visible. The amount of free oil was rated on a scale of

1 to 5 with 1 indicative of lots of free oil and 5 indicative of no visible amount of free floating oil. Similarly the amount of free fiber in the water was also visible assessed and rated according to the same scale. After this initial assessment, the residual amount of oil left in the mixture was measured. The mixture was poured through a sieve and allowed to drain for 5 minutes. The liquids that passed through the sieve were poured into a separating funnel and separated. The amount of oil separated from the water was collected and measured in a measuring cylinder. The difference between the amount of oil initially added to the water (20 g) and the amount of oil collected in the measuring cylinder was the amount of oil adsorbed on the pulp. The best oil absorbing pulp has the lowest amount of residual oil collected in the measuring cylinder.

For comparison untreated (PCTMP) was subjected to the same test. The results of these evaluations are listed below in Table 1

Table 1

	fiber, (g)	Visible determination of oil (scale: 1-best 5-worst)	Visible determination of fiber (scale: 1-best 5-worst)	Residual Oil (gm)
Untreated BCTMP	1.0	na	1	17
Treated ABCTMP	1.0	4	4	3.1

Clearly the treated paper pulp adsorbed a much greater amount of oil than the untreated paper pulp. In this comparison, the treated paper pulp absorbed greater than 16 times its weight in oil ((20-3.1 gm of oil)/1 gm pulp = 16.9). Thus the claimed invention absorbs a phenomenal amount of oil, which is completely unexpected in light of the teachings of Sohnius or Rowell considered either singly or in combination.

If the Examiner would desire or if it would further the prosecution of this application the above information can be provided in a signed affidavit to be submitted in this case.

Accordingly, it is urged that the rejections of claims 1, 3-6, 18-16, 20, 24, and 25 are overcome. Consequently, Applicants respectfully request that these rejections be withdrawn.

Claims 1, 3-6, 11, 15, 17, 20, 24, and 25 are rejected under 35 U.S.C. §103(a) over Norman et al. in view of Rowell et al.

The applicants respectfully disagree with the Examiner's interpretation of these two references and suggest that one skilled in the art would not be motivated to combine the teachings of Rowell with that of Norman. It was stated in the office action that both dimensional stability and resistance to biological degradation are obviously desirable characteristics for the paper material utilized in Norman et al. and that it would have been obvious to treat the paper of Norman in the manner taught by Rowell. Applicants respectfully disagree with this statement. There is no teaching or suggestion that the filter paper used in Norman suffers from dimensional instability or is prone to biological degradation. There is no expressly stated or implied rational stated in the prior art to combine these references. The applicants respectfully traverse this assertion and request that the Examiner provide support for this position. (See MPEP §2144.03.)

Additionally it is maintained that the cited references considered either singly or in combination do not teach or suggest the claimed invention. To support an obviousness rejection, the claimed invention as a whole must be considered. Claim 1 recites a "method of absorbing hydrophobic water-immiscible liquids from a mixture of such a liquid with water" Norman is directed toward and teaches removing polychlorinate biphenyls (PCB's from oils and hydrocarbon fluids--but not removing hydrocarbons from water. Norman performs his separation this by adding a sodium dispersion to react with and remove polyhalogenated aromatic compounds from hydrocarbon and silicon oils, such as a transformer oil. The process can use a filter system including, among other things, paper, to remove the excess sodium and other particulate matter. The purified, filtered oil is returned to the system from which it is removed. Norman does not teach or suggest removing the hydrcarbon or the aromatic compound from water. Rowell merely describes a method of acetylating wood fiber and teaches nothing about removing hydrocarbons from water. There is no teaching or suggestion in these references to use

acetylated the fiber to absorb hydrophobic, water-immisible liquids from a mixture of that liquid with water as presently claimed.

In light of the above discussion, Applicants urge that claim 1 as currently amended and claims 3-6, 8-15, 17, and 25 which depend from claim 1 are patentable over the combination of Norman et al. and Rowell.

CONCLUSION

In view of the foregoing discussion, reconsideration and withdrawal of all outstanding rejections, and allowance of this application containing claims 1, 3-6, 8-15, 17, 20, 24, and 25 are requested. In addition, the Examiner is invited to telephone the undersigned attorney if there are any questions about this submission and other formal matters, which might be addressed in that fashion to facilitate allowance of this application.

Respectfully submitted,

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